



وزارة الصحة

مستشفى الأمير محمد بن عبد العزيز بالرياض
Prince Mohammed bin Abdulaziz Hospital - Riyadh



Third year Medical college

Princess Nora Bint Abdulrahman University

Differential Diagnosis of Abdominal Pain (Acute & Chronic)

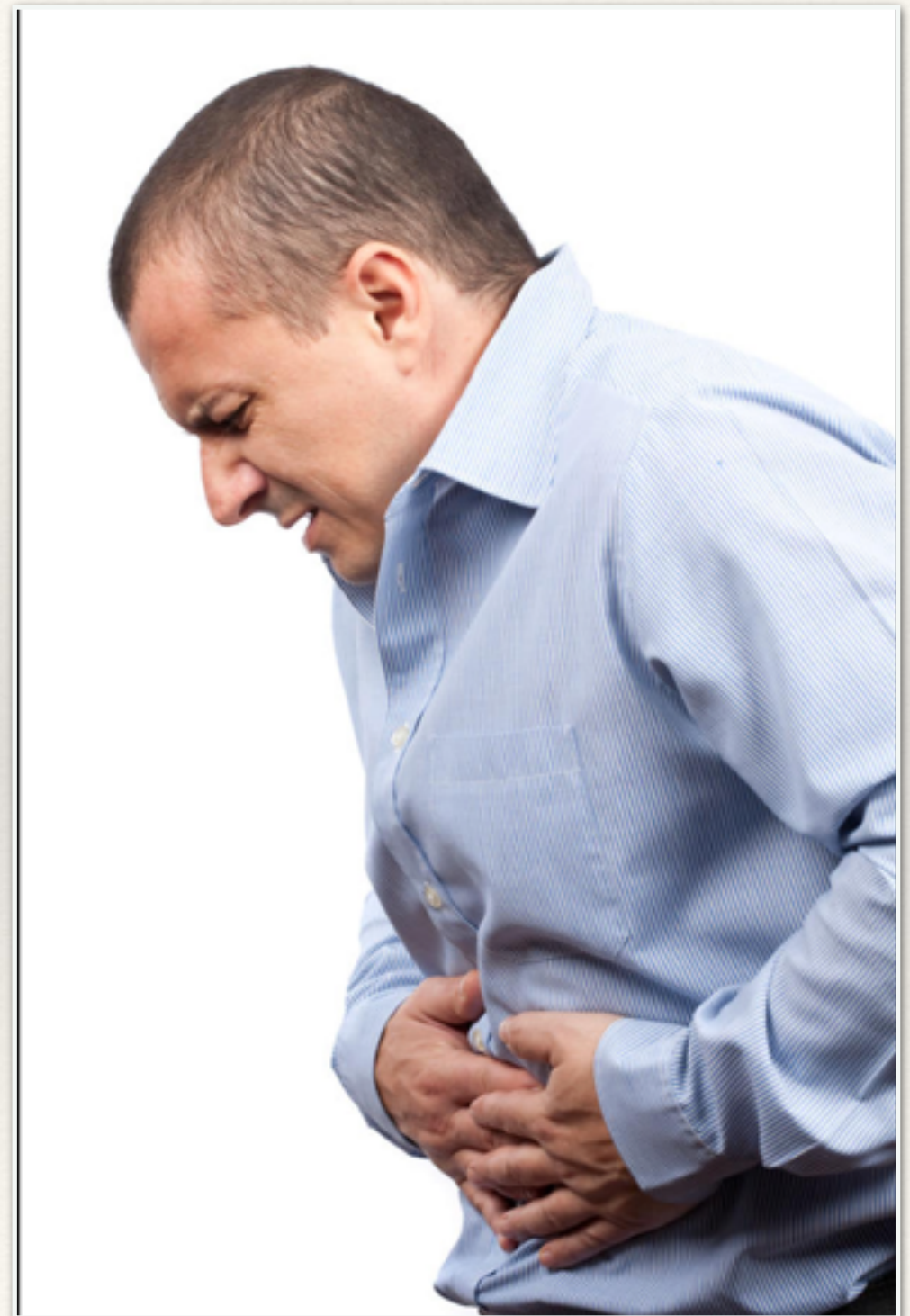
Dr. Bushr Murad
MBBS, FRCSC, ABSD

Consultant General & Bariatric Surgeon
Director of Day Surgery Unit



Objectives

- ❖ What is abdominal pain?
- ❖ What are common causes?
- ❖ How to approach and determine the cause?



Case scenario

- ❖ Think about each of these cases:
 - ❖ 18 / 12 child suddenly became inconsolable from AP while playing
 - ❖ A 20 yo man with 12 hours of diffuse crampy AP that migrated to RLQ that became sharp
 - ❖ 78 yo woman with Hx chronic steroid use with sudden sharp AP and a rigid exam

Magnitude

- ❖ Abdominal pain is present on questioning of 75 percent of otherwise healthy adolescent students and in about half of all adults
- ❖ The prevalence of abdominal pain is consistently high across diverse geographic regions and age groups

Abdominal pain

- ❖ “An acute abdomen” denotes any sudden, spontaneous, nontraumatic disorder whose chief manifestation is in the abdominal area and for which urgent operation may be necessary
- ❖ Chronic abdominal pain: Intermittent or constant abdominal pain (functional or organic) that has been present for at least two month

Types of abdominal pain

- ❖ Pain receptors respond to mechanical and chemical stimuli
- 1. **Visceral Pain (nociceptor)**: Stretch of capsules or walls of hollow viscus (distention, contraction, compression, torsion)
 - Crampy, achy, diffuse - Poorly localized (origin)
- 2. **Somatic Pain (Parietal)**: Chemical stimuli include substance P, bradykinin, serotonin, histamine, prostaglandin) released in inflammation and ischemia
 - Sharp, stabbing - Well localized (dermatome)

Sensory Levels associated with Visceral Structures

Structures	Nervous System Pathways	Sensory Level
Liver, spleen, and central part of diaphragm	Phrenic nerve	C3–5
Peripheral diaphragm, stomach, pancreas, gallbladder, and small bowel	Celiac plexus and greater splanchnic nerve	T6–9
Appendix, colon, and pelvic viscera	Mesenteric plexus and lesser splanchnic nerve	T10–11
Sigmoid colon, rectum, kidney, ureters, and testes	Lowest splanchnic nerve	T11–L1
Bladder and rectosigmoid	Hypogastric plexus	S2–4

VISCUS	SEGMENTAL INNERVATIONS	NERVES	PLEXUSES
Esophagus, trachea, bronchi	Vagus	C1-8 Sup. cardiac* Middle cardiac Inf. cardiac	
Heart and aortic arch	T1-T3 or T4	2-4 Thoracic cardiac	Cardiac Pulmonary*
Stomach	T5-T7	5-7	
Biliary tract	T6-T8	6-8	
Small intestine	T8-T10	8-10	
Kidney	T10-L1	10-12 Maj. splanchnic	Celiac and adrenal*
Colon	T10-L1	11-12 Min. splanchnic	Renal
Uterine fundus	T10-L1	12 Least splanchnic	Spermatic* Ovarian*
Uterine cervix		L1-5	Preaortic
Bladder	S ₂ -S ₄	S1-5 Sacral	Inf. mesenteric Sup. hypogastric
Rectum		3-5 Parasympathetic Bladder Cervix Rectum	Bladder* Prostate* Uterus

* No known sensory fibers in sympathetic rami.

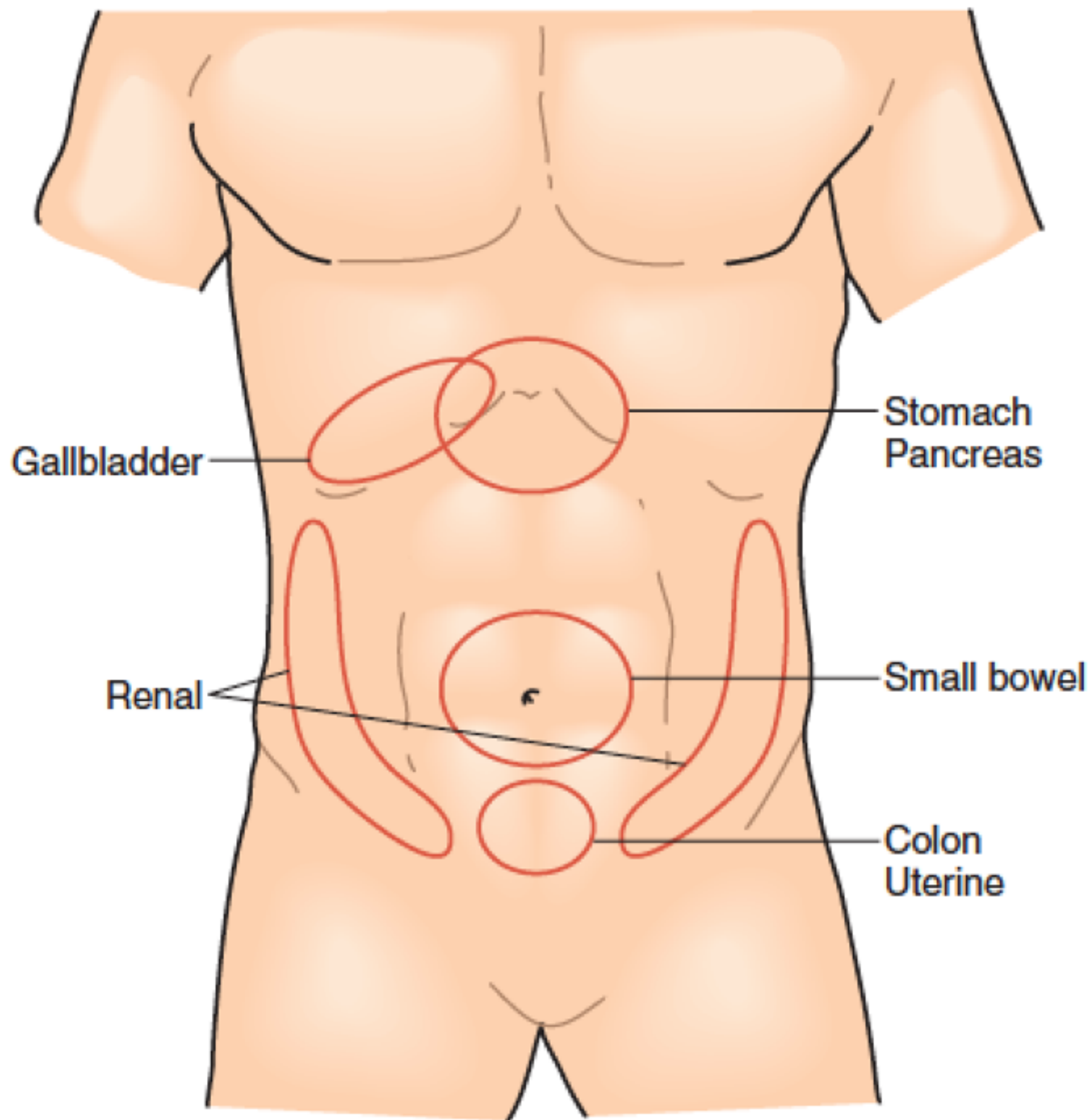


FIGURE 47-7 Common locations for visceral pain.

Types of abdominal pain

3. **Referred Pain:** Pain perceived at a site distant from the source of the stimulus (visceral afferent nerve fibers entering spinal cord close to inputs from somatic receptors)

Symptoms, but no signs

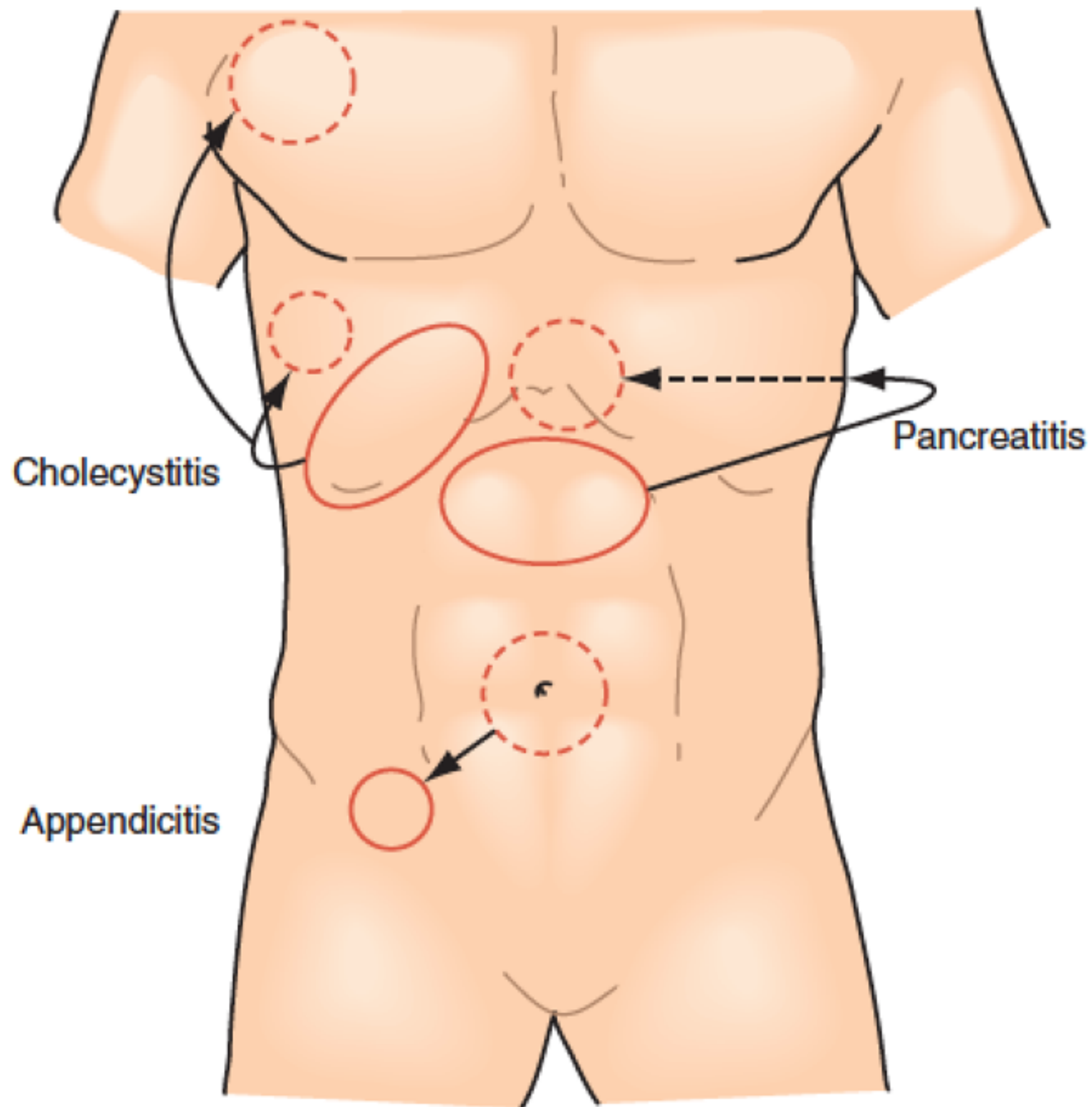
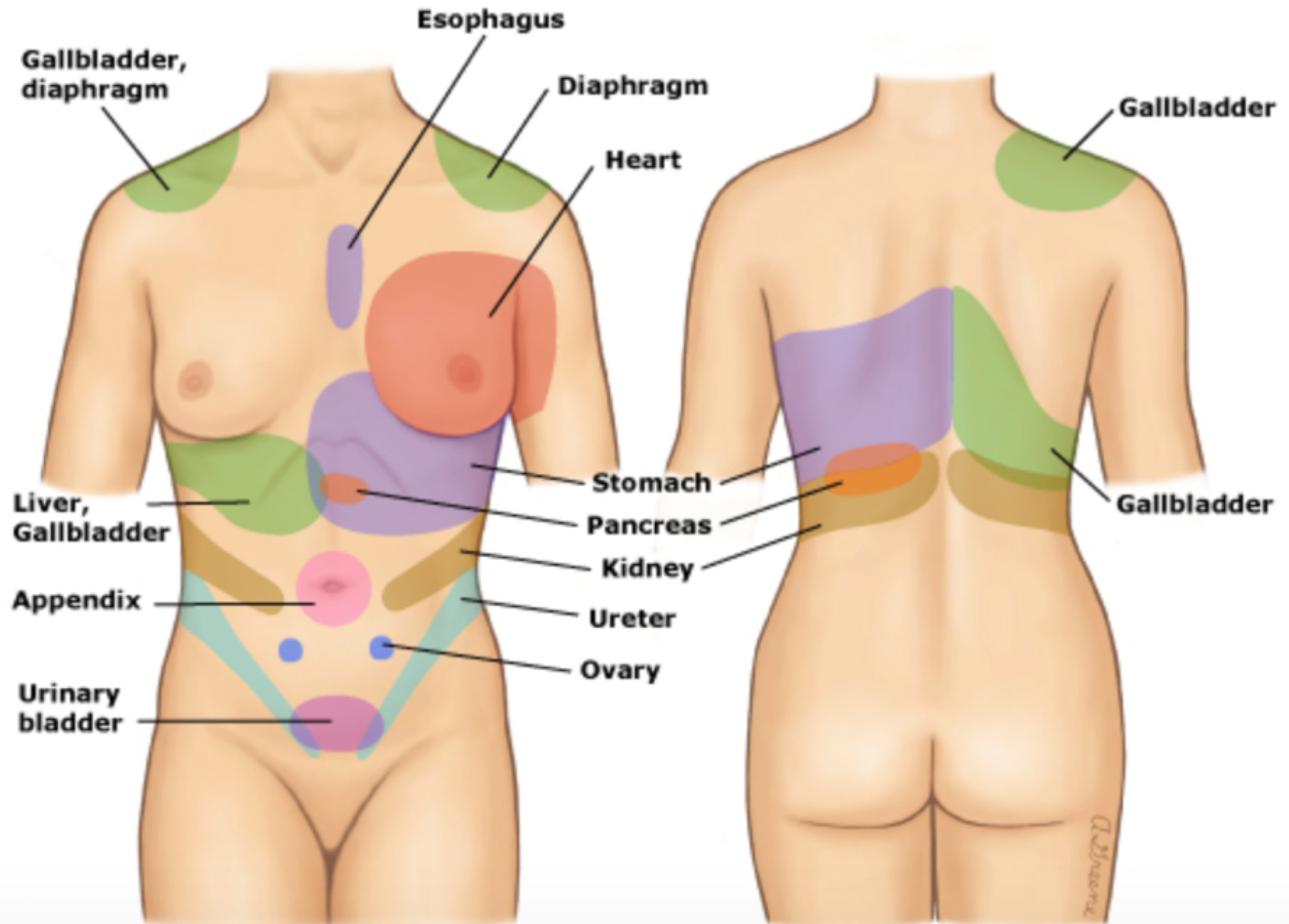


FIGURE 47-6 Referred pain. *Solid circles* are primary or most intense sites of pain.

Patterns of referred abdominal pain



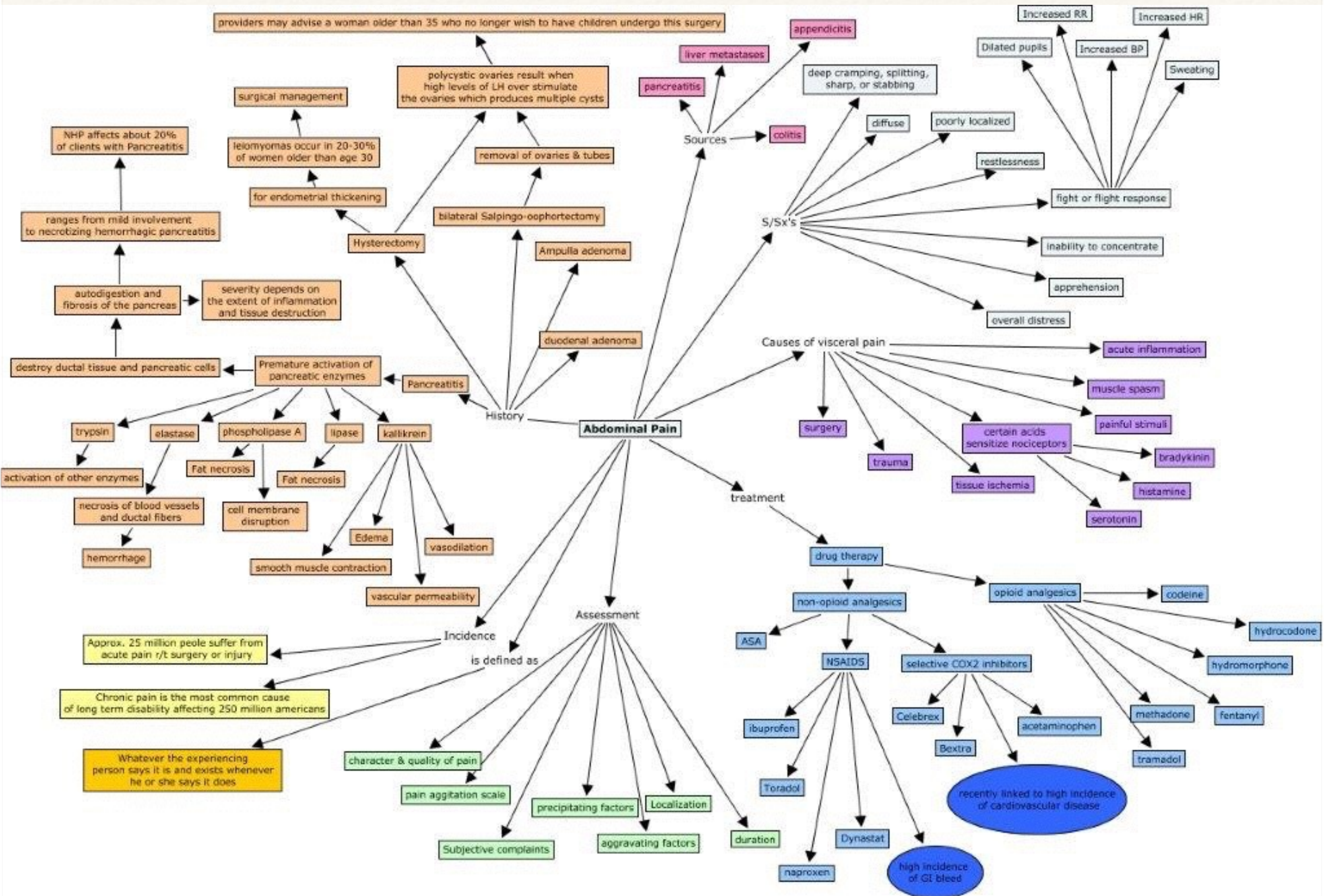
common

causes

of

abdominal pain





DDx acute abdomen (surgical abdomen)

GIT (peritoneal & retro- peritoneal disorders)	Appendicitis, SBO/LBO, Perforated PU, Incarcerated hernia, Bowel perforation, Meckel's diverticulitis, Boerhaave's syn, Diverticulitis, GE, IBD, Mallory-Weiss syn, Acute gastritis, Mesenteric adenitis, Parasitic infections, Nonspecific abd. pain, Intra-abdominal abscess, 1ry/TB peritonitis, Retroperitoneal hemorrhage.
Liver, spleen, biliary tract	Acute cholecystitis, Acute ascending cholangitis, Hepatic abscess, Ruptured hepatic tumor, Spontaneous rupture of spleen, Splenic infarction,
Pancreas	Acute pancreatitis
Urinary tract	Ureteric/renal colic, Acute pyelonephritis, Acute cystitis, Renal infarct
Gyne disorders	Ruptured ectopic pregnancy, Twisted ovarian tumor, Ruptured ovarian follicular cyst, Acute salpingitis, Dysmenorrhea, Endometriosis
Vascular disorder	Ruptured aortic aneurysm, Acute ischemic colitis, Mesenteric thrombosis

BOX 47-2 Surgical Acute Abdominal Conditions

Hemorrhage

Solid organ trauma
Leaking or ruptured arterial aneurysm
Ruptured ectopic pregnancy
Bleeding gastrointestinal diverticulum
Arteriovenous malformation of gastrointestinal tract
Intestinal ulceration
Aortoduodenal fistula after aortic vascular graft
Hemorrhagic pancreatitis
Mallory-Weiss syndrome
Spontaneous rupture of spleen

Infection

Appendicitis
Cholecystitis
Meckel's diverticulitis
Hepatic abscess
Diverticular abscess
Psoas abscess

Perforation

Perforated gastrointestinal ulcer
Perforated gastrointestinal cancer
Boerhaave's syndrome
Perforated diverticulum

Blockage

Adhesion induction small/large bowel obstruction
Sigmoid volvulus
Cecal volvulus
Incarcerated hernias
Inflammatory bowel disease
Gastrointestinal malignancy
Intussusception

Ischemia

Buerger's disease
Mesenteric thrombosis/embolism
Ovarian torsion
Ischemic colitis
Testicular torsion
Strangulated hernias

Acute abdomen

- ❖ The approach to a patient with an acute abdomen must be **orderly and thorough**.
- ❖ An acute abdomen must be **suspected** even if the patient has only mild or atypical complaints.
- ❖ The history and physical examination should **suggest the probable causes** and **guide** the choice of initial diagnostic studies.
- ❖ The clinician must then **decide** if in-hospital observation is warranted, if additional tests are needed, if early operation is indicated, or if nonoperative treatment would be more suitable.

DDx of chronic abdominal pain

DDx Chronic abdominal Pain

Common causes

GERD, PUD, GE, Lactate def., Chronic cholecystitis, Nephrolithiasis, PID, IBS, Functional dyspepsia, Functional abdominal pain syndrome, Chronic abdominal wall pain, Referred pain

Uncommon causes

IBD, Subacute intestinal obstruction, Celiac disease, Chronic pancreatitis, Esophageal cancer, Gastric cancer, CRC, Pancreatic cancer, HCC, Cholangiocarcinoma, Chronic mesenteric ischemia, SMA syn, Acute intermittent porphyria, Heavy metal poisoning, Familial Mediterranean Fever, Paroxysmal nocturnal hemoglobinuria, Chronic pyelonephritis, Endometriosis, Ovarian cyst, Narcotic bowel syndrome

DDx of non surgical acute abdomen

Table 21–6. Medical Causes of an Acute Abdomen for which Surgery Is Not Indicated.

Endocrine and metabolic disorders	Infections and inflammatory disorders
Uremia	Tabes dorsalis
Diabetic crisis	Herpes zoster
Addisonian crisis	Acute rheumatic fever
Acute intermittent porphyria	Henoch-Schönlein purpura
Acute hyperlipoproteinemia	Systemic lupus erythematosus
Hereditary Mediterranean fever	Polyarteritis nodosa
Hematologic disorders	Referred pain
Sickle cell crisis	Thoracic region
Acute leukemia	Myocardial infarction
Other dyscrasias	Acute pericarditis
Toxins and drugs	Pneumonia
Lead and other heavy metal poisoning	Pleurisy
Narcotic withdrawal	Pulmonary embolus
Black widow spider poisoning	Pneumothorax
	Empyema
	Hip and back

Common Diagnosis by quadrant

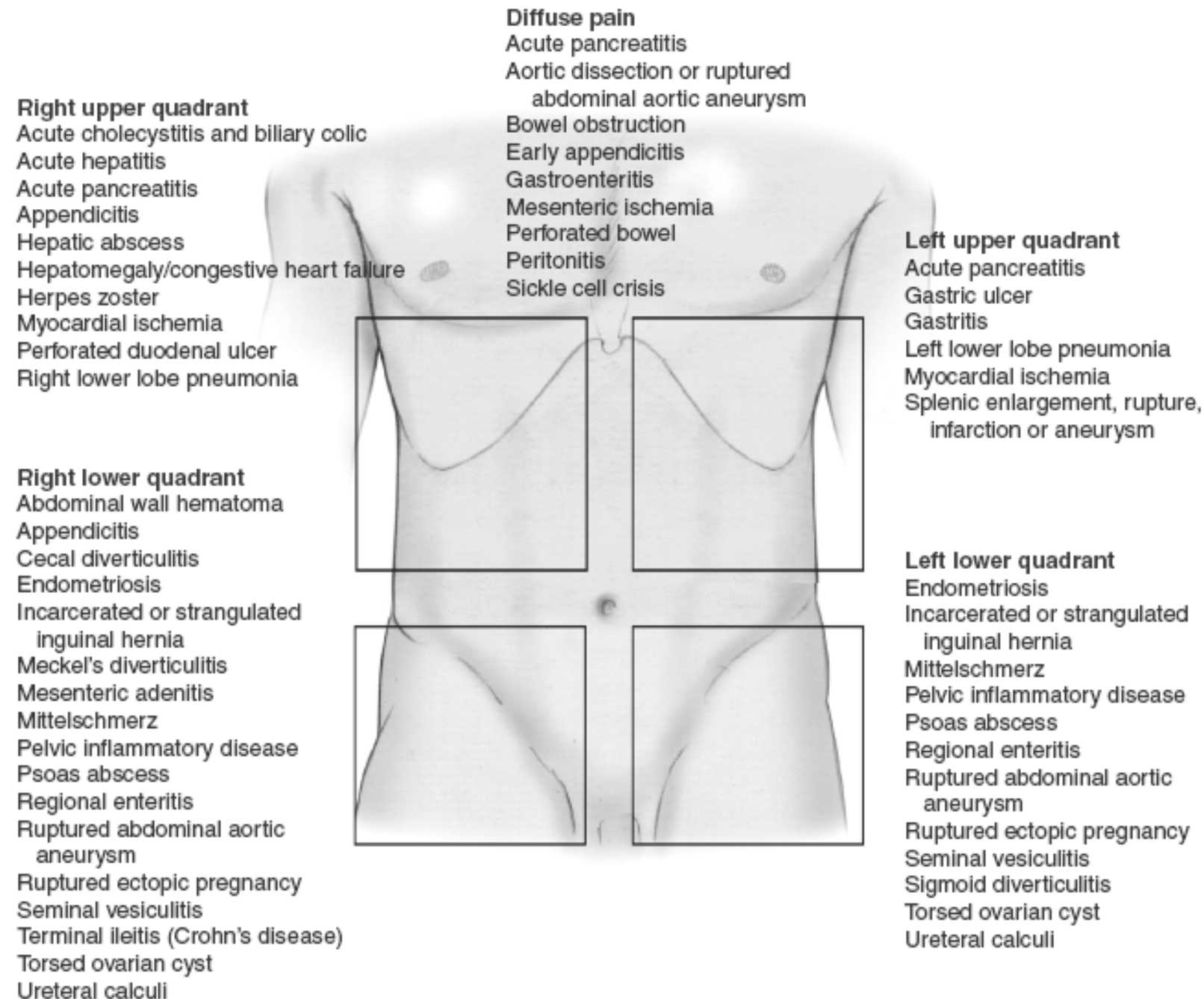


Figure 9.1

Differential diagnosis of acute abdominal pain by location. Adapted from Wagner DK. *Curr Topic* 1978;1(3).

KNOW YOUR ABDOMINAL PAIN

RIGHT

GALLSTONES
STOMACH ULCER
PANCREATITIS

KIDNEY STONES
URINE INFECTION
CONSTIPATION
LUMBAR HERNIA

APPENDICITIS
CONSTIPATION
PELVIC PAIN (GYNAE)
INGUINAL HERNIA

HEARTBURN/G.E.R.D.
INDIGESTION
STOMACH ULCER
PANCREATITIS
EPIGASTRIC HERNIA

PANCREATITIS
EARLY APPENDICITIS
INFLAMED BOWEL
UMBILICAL HERNIA

URINE INFECTION
DIVERTICULAR DISEASE
INFLAMED BOWEL
PELVIC PAIN (GYNAE)

LEFT

STOMACH ULCER
DUODENAL ULCER
BILIARY COLIC

KIDNEY STONES
DIVERTICULITIS
INFLAMMATORY BOWEL

DIVERTICULITIS
PELVIC PAIN
INGUINAL HERNIA

Clinical approach to a patient with abdominal pain



Hx taking in abdominal pain

- ❖ “OLD CARS”
 - ❖ O: onset
 - ❖ L: location
 - ❖ D: duration
 - ❖ C: character
 - ❖ A: aggravating / relieving factor
 - ❖ R: radiation
 - ❖ S: severity

Hx (cont.)

- ❖ PMHx:

- ❖ Similar episodes in the past
- ❖ Other medical conditions that may contribute to the presentation

- ❖ PSHx:

- ❖ Adhesions, hernias, tumors

- ❖ Meds:

- ❖ Abx, NSAIDS, Gastric acid blockers

- ❖ GYN/URO:

- ❖ LMP, Bleeding, Discharge

- ❖ Social:

- ❖ Tab, EtoH, drugs, home situation

Physical Examination in Abdominal Pain Presentation

- ❖ General appearance
 - ❖ “Sick versus not sick”
 - ❖ Mobile versus still
 - ❖ Obvious pain or discomfort
 - ❖ “Doorway” impression
- ❖ Vital signs
 - ❖ “That’s why they’re called vital”

P/E (cont.)

- ❖ Inspection
 - ❖ Distention, scars, bruises
- ❖ Auscultation
 - ❖ Present, hyper, or absent
 - ❖ Cough tenderness / “bump” tenderness
- ❖ Percussion
- ❖ Palpation
 - ❖ Often the most helpful part of exam
 - ❖ Tenderness versus pain (one finger)
 - ❖ Start away from painful area first (costal / costovertebral area)
 - ❖ Guarding, rebound tenderness, masses
- ❖ Special signs
- ❖ External and male genitalia
- ❖ Rectal and Pelvic examination

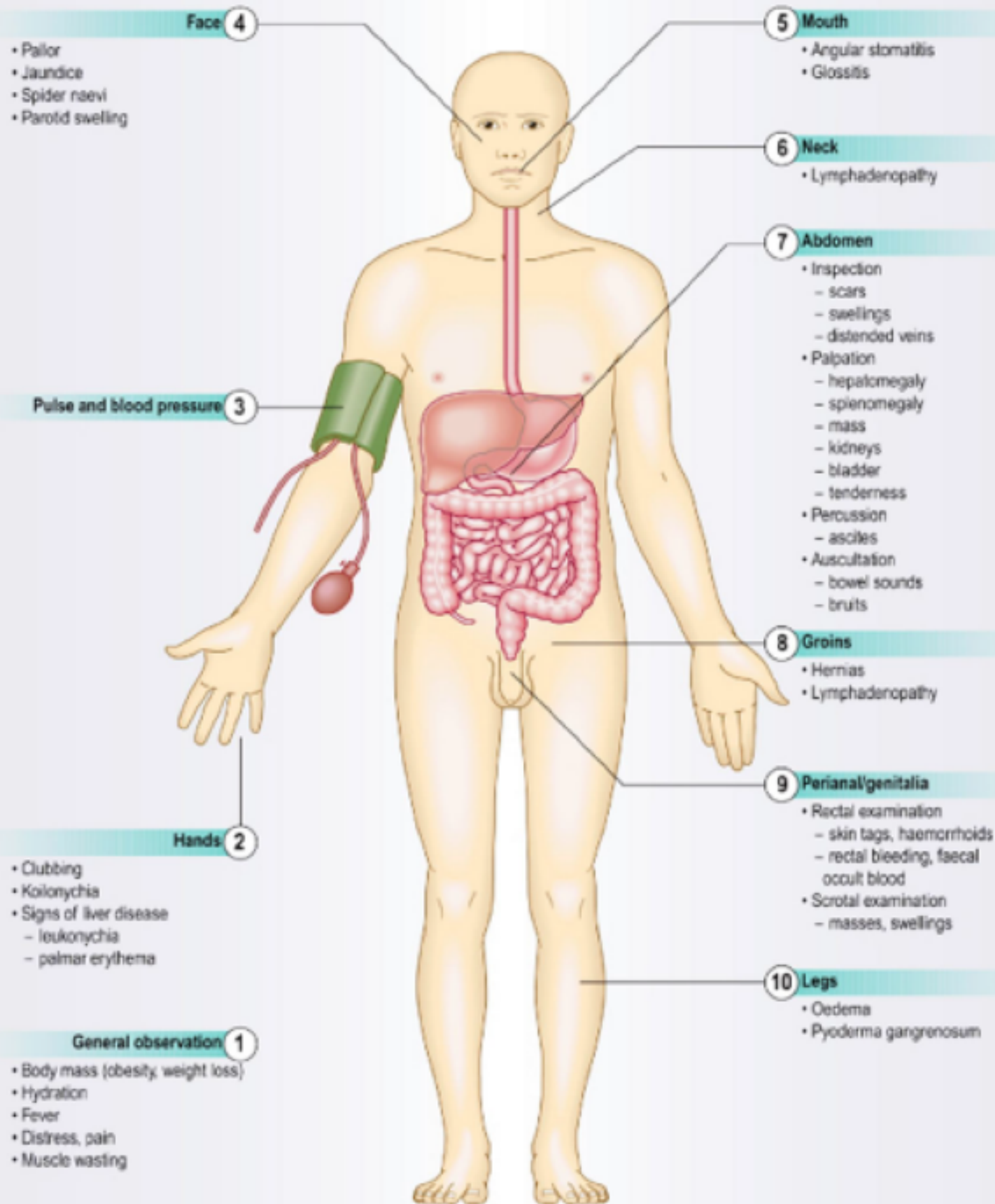


Table 47-1 Abdominal Examination Signs

SIGN	DESCRIPTION	DIAGNOSIS OR CONDITION
Aaron	Pain or pressure in epigastrium or anterior chest with persistent firm pressure applied to McBurney's point	Acute appendicitis
Bassler	Sharp pain created by compressing appendix between abdominal wall and iliacus	Chronic appendicitis
Blumberg	Transient abdominal wall rebound tenderness	Peritoneal inflammation
Carnett	Loss of abdominal tenderness when abdominal wall muscles are contracted	Intra-abdominal source of abdominal pain
Chandelier	Extreme lower abdominal and pelvic pain with movement of cervix	Pelvic inflammatory disease
Charcot	Intermittent right upper abdominal pain, jaundice, and fever	Choledocholithiasis
Claybrook	Accentuation of breath and cardiac sounds through abdominal wall	Ruptured abdominal viscus
Courvoisier	Palpable gallbladder in presence of jaundice	Periampullary tumor
Cruveihier	Varicose veins at umbilicus (caput medusa)	Portal hypertension
Cullen	Periumbilical bruising	Hemoperitoneum
Danforth	Shoulder pain on inspiration	Hemoperitoneum
Fothergill	Abdominal wall mass that does not cross midline and remains palpable when rectus contracted	Rectus muscle hematomas
Grey Turner	Local areas of discoloration around umbilicus and flanks	Acute hemorrhagic pancreatitis
Iliopsoas	Elevation and extension of leg against resistance creates pain	Appendicitis with retrocecal abscess
Kehr	Left shoulder pain when supine and pressure placed on left upper abdomen	Hemoperitoneum (especially from splenic origin)
Mannkopf	Increased pulse when painful abdomen palpated	Absent if malingering
Murphy	Pain caused by inspiration while applying pressure to right upper abdomen	Acute cholecystitis
Obturator	Flexion and external rotation of right thigh while supine creates hypogastric pain	Pelvic abscess or inflammatory mass in pelvis
Ransohoff	Yellow discoloration of umbilical region	Ruptured common bile duct
Rovsing	Pain at McBurney's point when compressing the left lower abdomen	Acute appendicitis
Ten Horn	Pain caused by gentle traction of right testicle	Acute appendicitis

Murphy's Sign

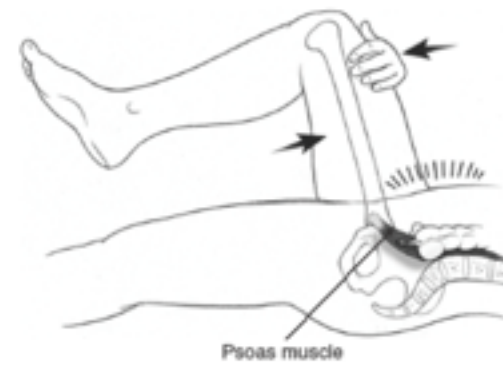


Figure 9.4
Psoas sign.



Figure 9.5
Obturator sign.

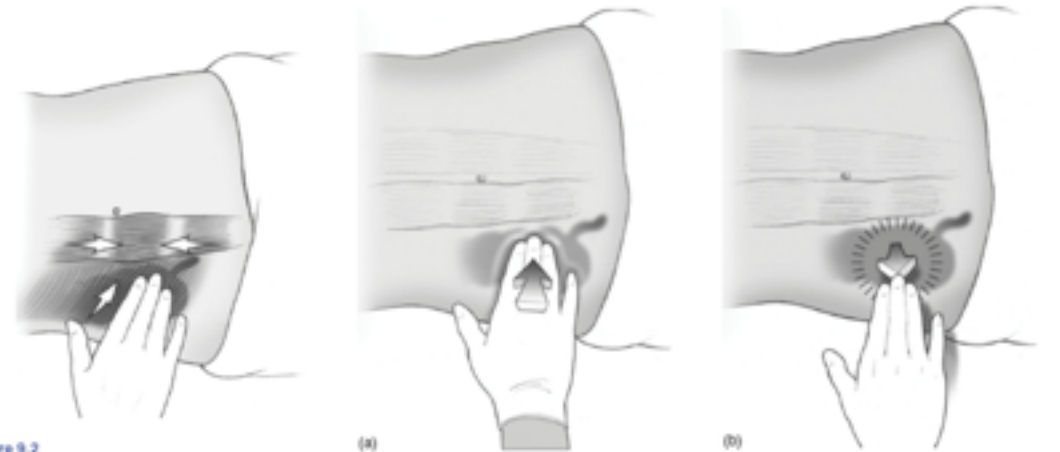


Figure 9.2
Guarding.

Figure 9.3
Rebound (a) hand down (b) hand up.

Labs

- ❖ Directed approach
 - ❖ CBCD
 - ❖ Electrolyte pannel
 - ❖ Renal profile
 - ❖ Liver pannel
 - ❖ Pregnancy test
 - ❖ ABGs, Hormonal levels, Tumor markers, ...
- ❖ Urine dipstick (urinalysis)
- ❖ Stool for analysis, C&S, FOBT



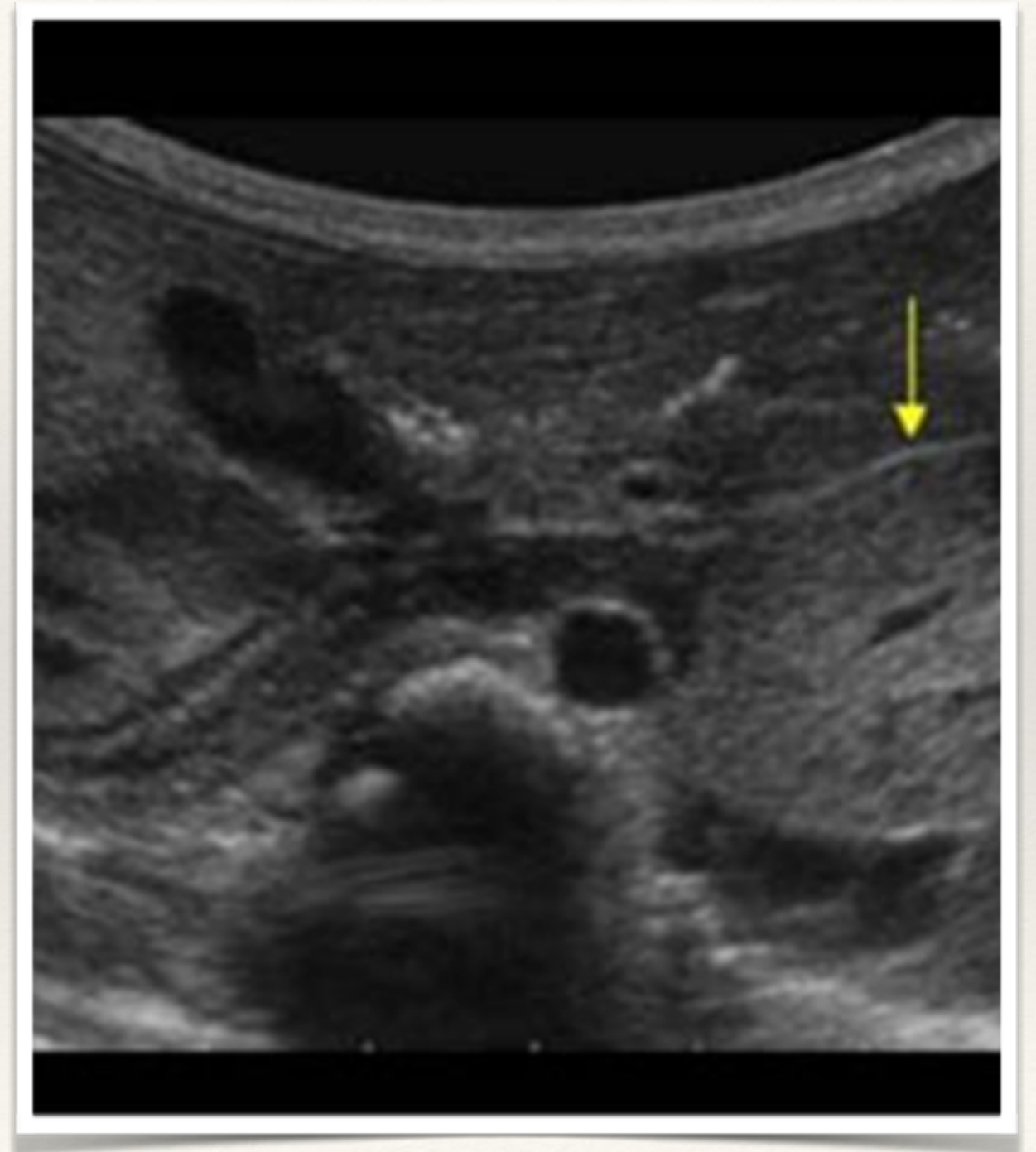
Images

- ❖ Plain films:
 - ❖ Free air
 - ❖ signs of obstruction
 - ❖ gas distribution (sentinal loop)
 - ❖ FB



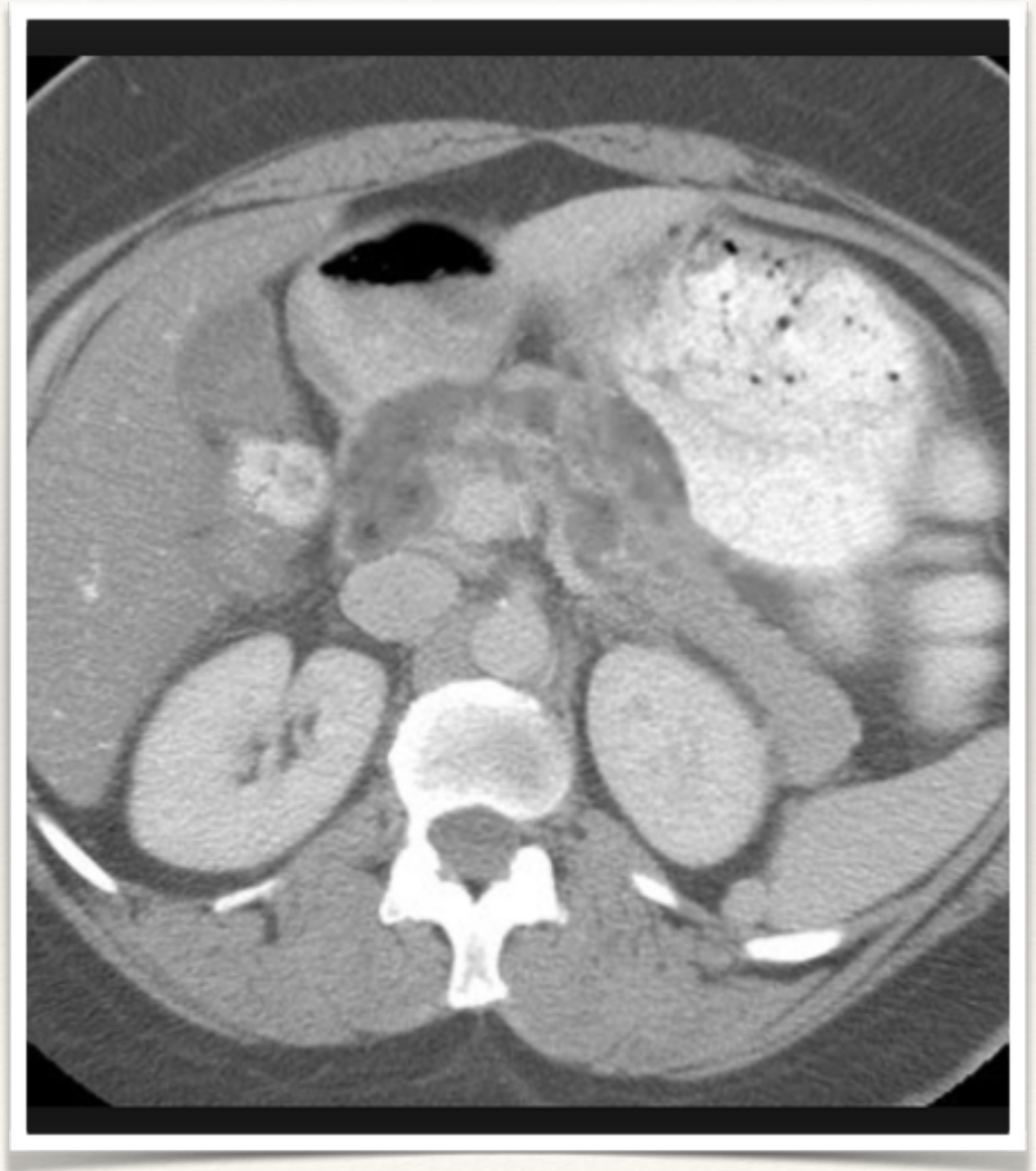
Images (cont.)

- ❖ USS:
 - ❖ Rapid, formal, may add doppler



Images (cont.)

- ❖ CT scan:
 - ❖ High accuracy for diagnosis, extent of the problem
 - ❖ Additional clinical uses (staging, operative planning)



Management

- ❖ Always right to start with ABC's
- ❖ IV access
- ❖ Fluid administration
- ❖ Antiemetics
- ❖ Analgesics
- ❖ Directed testing and imaging
- ❖ Re-evaluations
- ❖ Antibiotics
- ❖ Consultants
 - ❖ GS, OB / GYN, Uro, cardiologists, etc

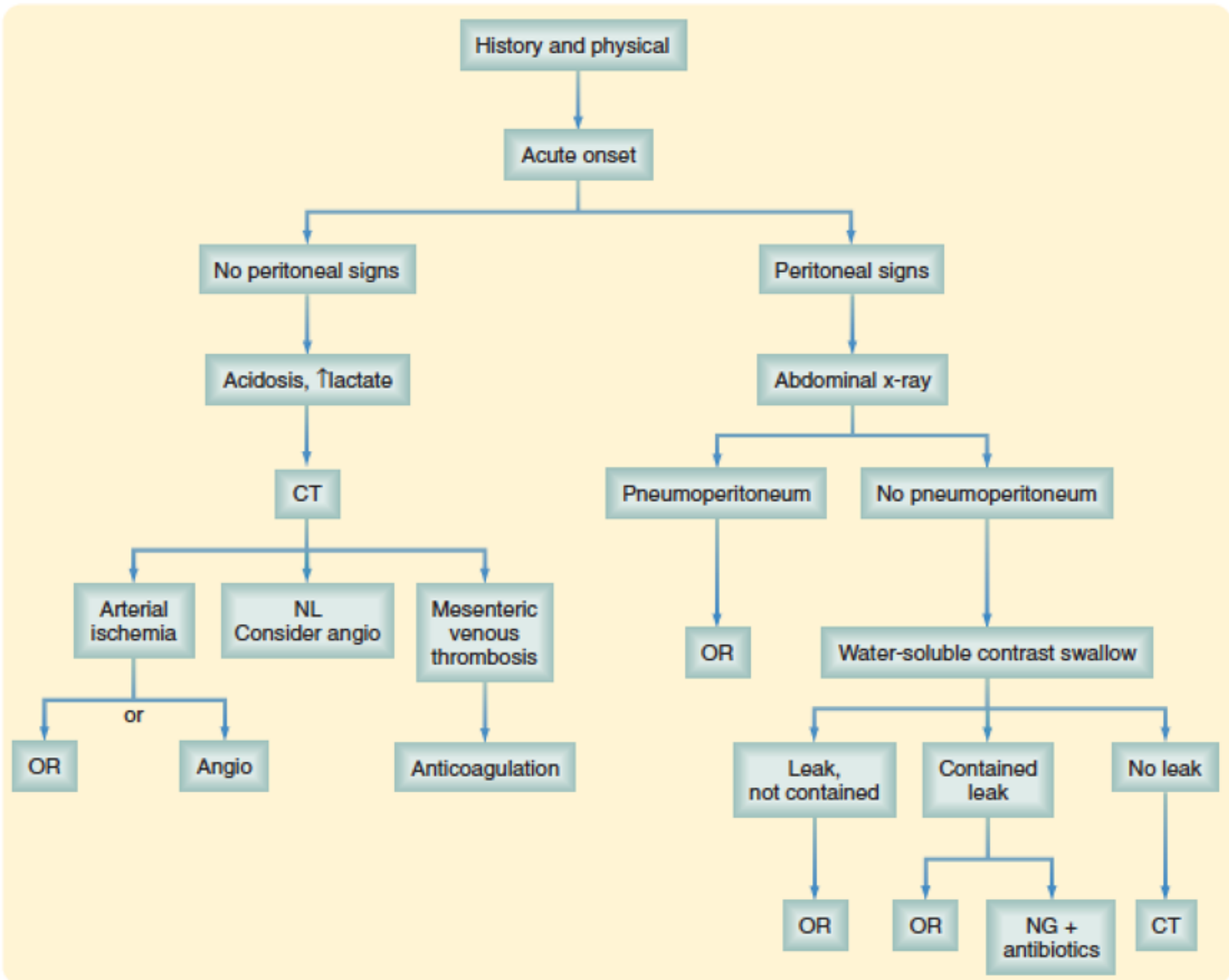


FIGURE 47-15 Algorithm for the treatment of acute-onset, severe, generalized abdominal pain. *NG*, Nasogastric tube; *NL*, normal study; *OR*, operation.

Case scenario conclusion

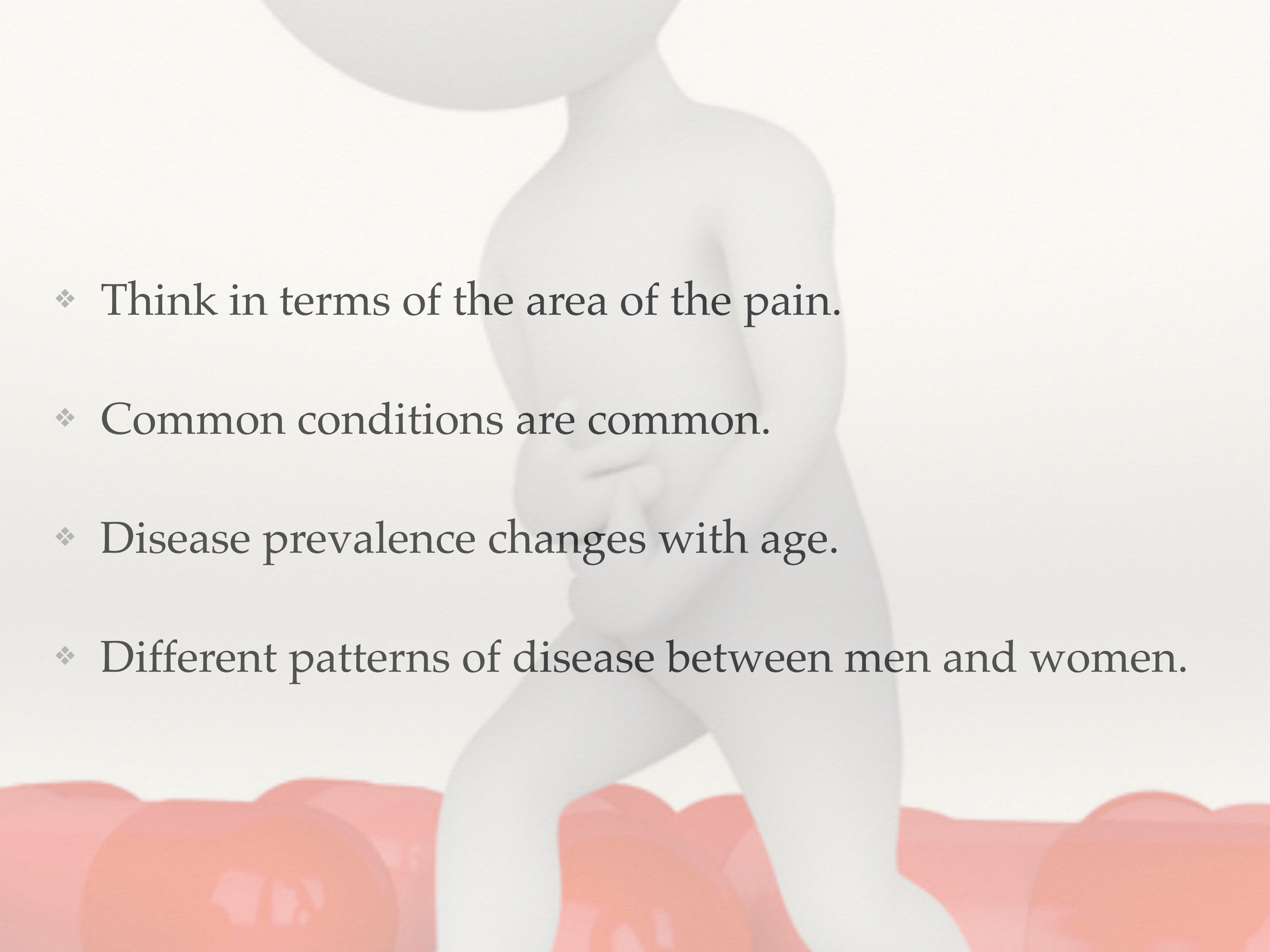
- ❖ 18 mo old had classic presentation of intussusception, and symptoms may wax and wane; rectal would be to look for current jelly stool. Air enema for diagnosis and reduction. Involve consultants early in the course.

Case scenario conclusion

- ❖ 20 year old with classic presentation of appendicitis, which likely does not need CT scan. Most do not present so simply, quite a wide array of presentations. General surgery consultation, pain meds, IVF, and an operation would all be good, but don't be shocked if CT requested.

Case scenario conclusion

- ❖ 78 yo has perforated abdomen, with age, multiple problems, and chronic steroids risks for perforation. Rapid resuscitation, plain films to confirm free air, antibiotics, pain medicine, and a surgeon as fast as you can would be good practice.

- 
- ❖ Think in terms of the area of the pain.
 - ❖ Common conditions are common.
 - ❖ Disease prevalence changes with age.
 - ❖ Different patterns of disease between men and women.